Claims

1-10. Canceled

11. (New) A method for operating a synchronous machine (1) which comprises a permanently excited rotor and a stator provided with phase windings, the method comprising:

determining a rotor position of the synchronous machine; and

applying at least one of a current or voltage vector having a defined duration to the phase windings in a direction of the determined rotor position, wherein the applying at least one of a current or voltage corrects of any possible angular error of the synchronous machine.

12. (New) The method according to claim 11, wherein a relative change of the rotor position is determined by a sensor element (5) synchronously with the application of the at least one voltage or current vector.

13. (New) The method according to claim 12, wherein the relative change is taken into consideration in an additional determination of the rotor position.

14. (New) The method according to claim 11, wherein square-wave voltage pulses are applied to the phase windings when the rotor position is determined.

15. (New) The method according to claim 14, wherein any possible relative change of the rotor position is determined by means of a sensor element (5) synchronously with the application of the square-wave voltage pulses.

16. (New) The method according to claim 11, wherein additional current or voltage

vectors in angles differing from the current rotor position are applied, and an indicator of the relative change of the rotor position is used as a criterion for judging the ease of motion (no-load condition) of the synchronous machine (1).

17. (New) A method for operating a synchronous machine (1) having a permanently excited rotor and a stator provided with phase windings, which is connected to an actuation electronic unit (2) including a data memory (6) for rotor position values, the method comprising:

reading a rotor position value stored in the data memory (6); and

applying at least one of a current or voltage vector having a defined duration to the phase windings in a direction of the determined rotor position, wherein the applying at least one of a current or voltage corrects of any possible angular error of the synchronous machine.

18. (New) The method according to claim 17, wherein prior to the reading of the rotor position value stored in the data memory (6), a check is made whether the rotor was secured against rotation by an anti-rotation mechanism since the last storing of the rotor position value.

19. (New) The method according to claim 17, wherein a relative change of the rotor position is determined by a sensor element (5) synchronously with the application of the at least one voltage or current vector, and in that the indicator of the relative change of the rotor position is used as a criterion for the quality of the stored rotor position values.

20. (New) The method according to claim 17, wherein a current vector that develops due to application of the voltage vector is determined by a current measuring device (4) and is used as a criterion for judging the condition of the electrical connections

of the phase windings.